

Marcy E. Litvak
Professor
Department of Biology
University of New Mexico
Albuquerque, NM 87131-1001
Phone: 277-5580 FAX: 277-0304
email: mlitvak@unm.edu

Educational History

B.A. with honors, 1989 Colorado College, Colorado Springs CO. Major field: Biology
Thesis Title: Reproductive biology of two species of alpine primroses
Thesis Advisor: Sylvia Kelso

Ph.D., 1998. University of Colorado, Boulder CO. Major field: Plant physiological ecology.
Dissertation Title: Ecological controls over the production and emission of non-methane hydrocarbons from plants and atmospheric chemistry implications.
Dissertation Advisor: Russell K. Monson

Employment History

- Full Professor, 2017- , Department of Biology, University of New Mexico, Albuquerque, NM
- Associate Professor, 2011-2017, Department of Biology, University of New Mexico, Albuquerque, NM
- Assistant Professor, 2006-2011, Department of Biology, University of New Mexico, Albuquerque, NM
- Adjunct Professor, 2005-present, Section of Integrative Biology, University of Texas, Austin, TX
- Assistant Professor, 2001-2005, Section of Integrative Biology, University of Texas, Austin, TX
- Postdoctoral Research Associate, 1998-2001, Department of Earth System Science, University of California, Irvine, CA. Michael Goulden, advisor.
- Graduate Teaching Assistant, 1993-1997, University of Colorado, Boulder, CO. General Biology
- Full-time Teaching Assistant, 1989-1991, Biology Department, The Colorado College, Colorado Springs, CO.

Professional recognition, Honors, etc.

- Fulbright Specialist grantee 2011-2015
- UA Advance "Junior Scientist Lecture Series", 2010
- UNM Student Athlete Appreciation, 2007
- Reed Fellowship, University of Texas, 2005-2006
- NASA Global Change Graduate Fellowship, 1993-1997
- Boettcher Scholarship, Colorado College 1984-1989

ARTICLES PUBLISHED IN REFEREED JOURNALS

In review

Novick, J.A. Biederman, A.R. Desai, M.E. Litvak, D.J.P. Moore, R.L. Scott. M.S. Torn. The Ameriflux Network: A coalition of the willing. In review *Ag For Met*.

Perdrual, J. PD Brooks, T Swetnam, KA Lohse, C Rasmussen, ME.Litvak, A A Harpold, X Zapata-Rios, P. Broxton, B. Mitra, R. Meixner, K. Condon, D. Huckle, C. Stielstra, A. Vazquez-Ortega, R. Lybrand, M. Holleran, C Orem, J Pelletier, J. Chorover. A net ecosystem carbon budget for snow dominated forested headwater catchments: linking water and carbon fluxes to critical zone carbon storage. In review *Biogeochemistry*

Biederman, J., Scott, R.L., Arnone, J.A. III, Jasoni, R.L., Litvak, ME; Moreo, MM, Papuga, SA, Ponce-Campos, G., Schreiner-McGraw, A.P., Vivoni, E. Shrubland exchanges of carbon dioxide across water availability gradients in the warm deserts of North America. In review *Ag For Met*

Barnard, D., J. Knowles, H. Barnard, M. Goulden, J. Hu, M. Litvak, and N. Molotch, Reevaluating growing season length controls on net ecosystem production. In review, *Ag For Met*

Robinson, E., M. Nuanez, and M.E Litvak. Biocrust contribution to ecosystem respiration exceeds contribution to gross primary production and varies by biome. In review, *Ecosphere*

Huang, C-W, J-C Domec, S. Palmroth, WT Pockman, ME Litvak, G Katul. Transport in a coordinated soil-root-xylem-phloem leaf system. In review *New Phytologist*

Morillas, L., R.E. Pangle, G.E. Maurer, W.T. Pockman, N. McDowell, C-W. Huang, D.J. Krofcheck, A.M. Fox, R.L. Sinsabaugh, T.A. Rahn, M.E. Litvak. Tree mortality decreases water availability and ecosystem resilience to drought in pinon-juniper woodlands in the southwestern USA. In review *JGR-Biogeosciences*

N.P. Molotch, J.F. Knowles, E. Trujillo, M.E. Litvak. Earlier snowmelt changes the ratio between early and late season forest productivity. In review *GRL*

In press

Schwalm, CR, R. Fisher, F. Biondi, G. Koch, ME Litvak, K. Ogle, J.D. Shaw, A. Wolf, D.N. Huntzinger, K. Schaefer, R. Cook, Y. Wei, Y. Fang, D. Hayes, M. Huang, A. Jain, H. Tian. 2017. Global patterns of drought recovery. *Nature* 548:202-205

Montane, F., A.M. Fox, A.F. Arellano, N. MacBean, M. Ross Alexander, A. Dye, D.A. Bishop, V. Trouet, F. Babst, A.E. Hessler, N. Pederson, P.D. Blanken, G.Boher, C. M. Gough, M.E. Litvak, K.A. Novick, R.P. Phillips, J.D. Wood, and D.J.P. Moore. 2017. *Geoscientific Model Development*. doi:10.5194/gmd-2017-74

Biederman JA, Scott RL, Bell TW, Bowling, DR, Dore, S. Garatuza-Payan, J, Kolb, TE, Krishnan P, Krofcheck, DJ, Litvak, ME, Maurer, GE, Meyers, TP, Oechel, WC, Papuga SA, Ponce-Campos GE, Rodriguez JC, Smith WK, Vargas R, Watts CJ, Yopez EA, Goulden ML. CO₂ exchange and evapotranspiration across dryland ecosystems of southwestern North America. *Glob Change Biol*. 00:1–18.
<https://doi.org/10.1111/gcb.13686>

Brewer, W., C. Lippit, M.E. Litvak, C. Lippit. Assessing drought-induced change in a

- pinon-juniper woodland with Landsat: a multiple endmember spectral mixture analysis approach. In press. *International Journal of Remote Sensing*.
- Villegas, J. C., D. J. Law, S. C. Stark, D. M. Minor, D. D. Breshears, S. R. Saleska, A. L. S. Swann, E. S. Garcia, E. M. Bella, J. M. Morton, N. S. Cobb, G. A. Barron-Gafford, M. E. Litvak, and T. E. Kolb. 2017. Prototype campaign assessment of disturbance-induced tree loss effects on surface properties for atmospheric modeling. *Ecosphere* 8(3):e01698. [10.1002/ecs2.1698](https://doi.org/10.1002/ecs2.1698)
- Sinsabaugh, R. L., Moorhead, D. L., Xu, X. and Litvak, M. E. (2017), Plant, microbial and ecosystem carbon use efficiencies interact to stabilize microbial growth as a fraction of gross primary production. *New Phytol.* doi:10.1111/nph.14485
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- Wolf, S., T.F. Keenan, J.B. Fisher, D.D. Baldocchi, A.R. Desai, A.D. Richardson, R.L. Scott, B.E. Law, M.E. Litvak, N.A. Brunsell, W. Peters, I.T. van der Laan-Lujikx. 2016 Warm spring reduced carbon cycle impact of the 2012 US summer drought. *PNAS* 113(21), 5880–5885, doi: 10.1073/pnas.1519620113.
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- Stark, S.C., D.D. Breshears, E.S. Garcia, D.J. Law, D.M. Minor, S.R. Saleska, A.L.S. Swann, J. C. Villegas, L. E.O. C. Arago, E. M. Bella, L.S. Borma, N.S. Cobb, M. E. Litvak, W. E. Magnusson, J.M. Morton, M.D. Redmond. 2016. Toward accounting for ecoclimate telconnections: intra- and inter-continental consequences of altered energy balance after vegetation change. *Landscape Ecol.* 31:181-194. DOI [10.1007/s10980-015-0282-5](https://doi.org/10.1007/s10980-015-0282-5).
- Warnock, D.D., M.E. Litvak, L. Morillas, R.L. Sinsabaugh. 2016. Drought-induced pinon mortality alters the seasonal dynamics of microbial activity in pinon-juniper woodland. *Soil Biol Biochem.* 92: 91-101.
- Petrie, M. D., N. A. Brunsell, R. Vargas, S. L. Collins, L. B. Flanagan, N. P. Hanan, M. E. Litvak, and A. E. Suyker (2016), The sensitivity of carbon exchanges in Great Plains grasslands to precipitation variability, *J. Geophys. Res. Biogeosci.*, 121, doi:[10.1002/2015JG003205](https://doi.org/10.1002/2015JG003205).
- Krofcheck, D. J., J.U.H. Eitel, C.D. Lippitt, L. A. Vierling, U. Schulthess, and M. E. Litvak. 2015 Remote sensing based simple models of GPP in both disturbed and undisturbed pinon-juniper woodlands in the Southwest U.S. *Remote Sens.* **2015**, 8(1), 20; doi:[10.3390/rs8010020](https://doi.org/10.3390/rs8010020).
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- Harley, P.C., M.E. Litvak, T.D. Sharkey, and R.K. Monson (1994). Isoprene emission from velvet bean leaves. Interactions among nitrogen availability, growth photon flux density, and leaf development. *Plant Physiology* 105:279-285.
- Miller, J., M. Litvak, S. Kelso, and A. Vargo (1993). Comparative reproductive biology of two alpine species of primrose. *Arctic Alpine Res.* 26:297-303.

ARTICLES APPEARING IN CHAPTERS IN EDITED VOLUMES

- Litvak, M.E., S. Schwinning, and J. Heilman. 2011. The role of ecosystem structure in regulating fluxes in Oak/Juniper Savannas in Central Texas, USA. Published in "Ecosystem Function in Global Savannas: Measurement and Modeling at Landscape to Global Scales", edited by Michael J. Hill and Niall P. Hanan and published by CRC/Taylor and Francis.
- Hauwert, N. M., Litvak, M. E., & Sharp, J. M. (2005, August). Characterization and water balance of internal drainage sinkholes. In Sinkholes and the Engineering and Environmental Impacts of Karst (pp. 188-200). ASCE.
- Litvak, M.E. (2003). Biogenic non-methane hydrocarbons. In: "McGraw-Hill Handbook of Weather, Climate and Oceans" (eds. T.D. Potter, and B. Coleman). John Wiley & Sons.
- Litvak, M. and T. Perez. Global tropospheric chemistry. In: *Notes from 1996 Colloquium on Terrestrial Ecosystems and the Atmosphere*, Boulder, CO, 14-27 July 1996 (eds. D. Schimel and R. Monson). Advanced Study Program, NCAR, Boulder, CO.

INVITED ORAL PLENARY AND/OR ORGANIZED SESSIONS AT PROFESSIONAL MEETINGS

- Litvak, M.E. 2016. Quantifying the response and resilience of carbon dynamics in semi-arid biomes in the Southwestern US to drought. 101st ESA annual meeting, Aug 7-12, 2016. Ft. Lauderdale, FL.
- Litvak, M.E. 2016. The Future of Ameriflux. 20th Anniversary of the Ameriflux Network:

- Past Research Accomplishments and Future Directions to Advance Understanding of Terrestrial Ecosystem Function in the Anthropocene. 101st ESA annual meeting, Aug 7-12, 2016. Ft. Lauderdale, FL.
- Litvak, M.E. 2015. Detection of extreme climate events in semi-arid biomes using a combination of near-field and satellite based remote sensing across the New Mexico Elevation Gradient network of flux towers. AGU Fall Meeting Dec. 12-16, 2015, San Francisco, CA.
- Litvak, M.E., 2015. Quantifying the resilience of carbon dynamics in semi-arid biomes in the Southwestern US to drought. 2015 AGU Fall Meeting, Dec. 12-16, 2015, San Francisco, CA.
- Litvak, M.E. 2014. Carbon and energy balance consequences of widespread mortality in Piñon-Juniper Woodlands. TES/SBR Joint Investigators Meeting, May 6-7, 2014. Plenary. Potomac, MD.
- Litvak, M.E., D. Krofcheck, L. Morillas, T. Hilton. A. Fox, 2014. Local to regional scale energy balance consequences of widespread mortality in piñon-juniper woodlands. 2014 AGU Fall Meeting, December 15-19, San Francisco, CA.
- Litvak, M.E., D. Krofcheck, L. Morillas, A. Fox, 2014. Observing and Quantifying Ecological Disturbance Impacts on Semi-Arid Biomes in the Southwestern US. 2014 AGU Fall Meeting, December 15-19, San Francisco, CA.
- Krofcheck, D. L. Morillas, M. Litvak. 2014. Investigating the biophysical controls on mass and energy cycling in Southwestern US ecosystems using the New Mexico Elevation Gradient of flux towers. 2014 AGU Fall Meeting, Dec 15-19, San Francisco, CA.
- Litvak, M.E.; D. Krofcheck; Timothy W. Hilton; Andrew M. Fox. Quantifying the vulnerability of carbon stocks and fluxes in six semi-arid biomes in the Southwestern US to the severe 2011-2013 drought 2013 AGU Fall Meeting, December 9-13, San Francisco, CA.
- Litvak, M.E. T. Hilton, D. Krofcheck, A. M. Fox, R. Sinsabaugh, N. McDowell, T. Rahn, A. Neuenschwander. Carbon and energy balance consequences of widespread mortality in piñon-juniper woodlands. 2013 Ecological Society of America Annual Meeting, August 4-9, Minneapolis, MN.
- Litvak, M.E. Vulnerability, thresholds, tipping points: TE response to the USGCRP 2015 agenda 2013 NASA Terrestrial Ecology Science Team Meeting. Plenary. April 30-May 2, 2013. La Jolla, CA.
- Litvak, M.E., T. W. Hilton, D. Krofcheck, A.M, Fox, A. Neuenschwander. 2013. Quantifying the vulnerability of carbon stocks and fluxes in six semi-arid biomes in the Southwestern US to both temperature and precipitation extremes. Plenary. 2013 Ameriflux/NACP Meeting, Feb. 4-7, 2013. Albuquerque, NM.
- Pockman, W.T., A. Boutz, J-M. Limousin, R. Pangle, J. Plaut, M. Thomey, S. Collins, M. E. Litvak, N. McDowell, E. Small. Community and ecosystem scale responses to precipitation variability and extremes in semiarid grasslands, shrublands and woodlands. 2013 Ecological Society of America Annual Meeting, August 4-9, Minneapolis, MN.
- Brooks, P.D.; A.A. Harpold; J.A. Biederman; D. J. Gochis; M. E. Litvak; B.E. Ewers; P. D.

- Broxton; D.E. Reed Non-linear Feedbacks Between Forest Mortality and Climate Change: Implications for Snow Cover, Water Resources, and Ecosystem Recovery in Western North America (*Invited*). 2013 AGU Fall Meeting, December 9-13, San Francisco, CA.
- Litvak, M.E., T. W. Hilton, D.J. Krofcheck, A.M.Fox, E.Robinson, N. McDowell, T. Rahn, R. Sinsabaugh. 2012. Quantifying the transient carbon dynamics of ecosystem scale carbon cycle responses to piñon pine mortality using a large-scale experimental manipulation, remote sensing and model-data fusion. AGU 2012 Fall Meeting, Dec 3-7, 2012, San Francisco, CA.
- Litvak, M.E. 2011. Use of a tower network to reduce uncertainties about how carbon balance in the southwest will respond to climate change. Marcy Litvak (University of New Mexico, Sevilleta LTER). LTER Science Council meeting, Jekyll Island, GA. May 18-19.
- Litvak, M.E. 2011. Use of a tower network to reduce uncertainties about how carbon balance in the southwest will respond to climate change. Marcy Litvak (University of New Mexico, Sevilleta LTER). 2011 LTER Outreach Minisymposium, March 2, National Science Foundation, Arlington, VA.
- Litvak, M.E., A.M. Fox, D. Krofcheck and L. Stoscheck. Plenary talk. Linking Climate, NEE and NDVI across semi-arid biomes in the Southwestern US using the NMEG cluster of flux towers. Joint Ameriflux and North American Carbon Program Annual Meeting, New Orleans, LA, January 31-Feb, 4 2011.
- Litvak, M.E., A. Fox, and R. Sinsabaugh. Investigating the pulse dynamics paradigm at the ecosystem scale in undisturbed and disturbed biomes across an elevation gradient in the semiarid Southwest. American Geophysical Union annual meeting, San Francisco, CA, Dec. 13-17, 2010.
- Litvak, M.E. Quantifying the sensitivity of vegetation to climate change across a New Mexico elevation gradient. 2009. SAHRA annual meeting, Tuscon, AZ. Sept. 23-24, 2009.
- Litvak, M.E. and A.M. Fox. 2009. Determining the sensitivity of New Mexico biomes to predicted climate change scenarios of the Southwest. Ameriflux Annual Meeting, Sept. 21-23, 2009. Washington, D.C.
- Litvak, M.E. and P. Brooks. 2008. Ecohydrology in complex terrain: lessons from measurements in a Ponderosa pine forest and subalpine mixed conifer woodland in the Valles Caldera, NM. CUAHSI Biennial Science Meeting. July 14-16, Boulder, CO.
- Litvak, M.E. 2007. Exploring the linkages between ecological disturbance, ecosystem structure and ecosystem function. Guild of Rocky Mountain Ecology and Evolutionary Biologists annual meeting, Ghost Ranch, NM. Plenary speaker.
- Litvak, M.E. 2007: Identifying climatic controls over surface fluxes across an elevational gradient. Joint Sevilleta and Jornada LTER Projects Research Symposium. July 12, Las Cruces, NM.
- Litvak, M.E. 2007. Responses of biosphere-atmosphere exchange to land-use change and ecological disturbances in water-limited ecosystems. BEACHON WORKSHOP, National Center for Atmospheric Research, Nov. 15, 2007.

INVITED SEMINARS

- 2016:** Rocky Mountain Biological Lab, Summer Tuesday Talk Series, June 21, 2016.
Gothic, CO.
- 2015:** University of Arizona Department of Ecology and Evolutionary Biology,
October 19, 2015
- 2015:** Northern Arizona University, Biological Sciences, Nov 9, 2015.
- 2012:** University of Texas El Paso, Environmental Science and Engineering Program, May
11, 2012.
- 2012:** Ohio State University, Department of Evolution, Ecology & Organismal Biology
Feb 2, 2012
- 2010:** University of Arizona School of Earth and Environmental Sciences (SEES),
October 2010
- 2009:** New Mexico Tech University, March 2, 2009. Hydrology Seminar. Socorro, NM.
- 2005:** Department of Crop and Soil Science, Texas A&M, College Station
- 2005:** Biology Department, University of New Mexico
- 2005:** Department of Integrative Biology, University of Texas, Austin, TX.
- 2004:** Department of Integrative Biology, Texas State University.
- 2004:** Department of Biology, Colorado College – Plenary speaker for Biology Day,
Colorado Springs, CO.
- 2000:** Department of Integrative Biology, University of Texas, Austin.
- 1999:** Department of Biology, University of New Mexico
- 1998:** Earth System Science Department, University of California-Irvine

Invited Lectures

- 2008-2017** Summer Course on Flux Measurements and Advanced Modeling,
Measurement and analysis of fluxes across ecological gradients. LTER
Mountain Research Station, Niwot Ridge, CO.
- 2004** Geological Sciences, Hydroclimatology course at University of Texas-Austin: Methods for
measuring evapotranspiration.
- 2003** REU program in environmental science, “Carbon Balance in Canadian
Boreal Forest”, University of Texas, Summer 2003
- 2003** Forum Seminar at UT-Austin- The Science of Environmental Change, Studies Bridging
Disciplines Program, “Terrestrial Ecosystems and Functions/Services They Provide”.
- 2003** Geological Sciences, Biogeochemistry course at UT-Austin, “Carbon Balance in
Terrestrial Ecosystems: Methods and Major Findings”, Spring 2003
- 2003** Environmental Science Institute at UT-Austin: Carbon, Water and Energy Cycling in
Savannah Ecosystems on the Edwards Plateau”, Lady Bird Johnson Wildflower Center
- 2002** Geological Sciences, Hydrology – “Eddy covariance, techniques/applications”,
- 2002** NSC 110 (Natural Sciences 110, Dean's Scholars Seminar), “Carbon Storage Along
Boreal Forest Chronosequence”, University of Texas, Fall 2002

RESEARCH FUNDING

Current Funding:

1. Quantifying the effects of species range shifts and management of post-fire recovery on regional carbon dynamics in a changing climate; Matt Hurteau (PI), M.Litvak and S. Collins (co-PI). NASA/USDA \$869,671.
2. Chlorophyll Fluorescence and soil moisture observation to characterize
3. terrestrial vegetation photosynthesis and biosphere carbon uptake in North America. NASA, N. Parazoo, PI. 1/17-12/19.
4. Ameriflux Core Support; DOE; Marcy Litvak (PI); 07/01/13 – 9/30/21 \$ 1,930,215
5. Collaborative Research: Hydrological tipping points and desertification of semi-arid woodlands. NSF-Ecosystems. Marcy Litvak (PI), Will Pockman, Susan Schwinning; Andy Fox; April 1, 2016- March 31, 2019. \$1,234,148.
6. RAPID: Leveraging the 2015-2016 El Nino to evaluate drought legacy effects on tree growth responses to rare wet events; NSF. Kiona Ogle (PI), G. Koch, C. Schwalm, F. Biondi, W. Anderegg, M.E. Litvak. June 15, 2016- June 14, 2017. \$ 190,873.
7. Determining the impact of forest mortality in semi-arid woodlands on local and regional carbon dynamics. M. Litvak (PI), R.L. Sinsabaugh, A. Fox, N. McDowell. DOE BER. 7/1/2012-6/30/17. \$1,049,194.
8. Transformative Behavior of Energy, Water and Carbon in the Critical Zone II: Quantifying the Interactions between Long- and Short-term Processes that Control Critical Zone Services. NSF-EAR Subaward to: Marcy Litvak 10/1/13-9/31/18. \$202,202.
9. Sevilleta Long Term Ecological Research V: Long term ecological research in a biome transition zone. WT Pockman (PI), SL Collins, ME Litvak, J. Rudgers, K. Vanderbilt and (+ 17 non-signatory co-PIs), NSF-DEB, LTER Program, 4/01/2015 – 3/31/2017, \$1,970,000.

Past Funding:

1. Sevilleta Long Term Ecological Research V: Long term ecological research in a biome transition zone. WT Pockman (PI), SL Collins, ME Litvak, J. Rudgers, K. Vanderbilt and (+ 17 non-signatory co-PIs), NSF-DEB, LTER Program, 10/01/2012 – 3/31/2015, \$2,520,000.
2. Sevilleta Long Term Ecological Research IV: Long term ecological research in a biome transition zone. SL Collins (PI), CN Dahm, WT Pockman, K. Vanderbilt and ME Litvak (+ 17 non-signatory co-PIs), NSF-DEB, LTER Program, 10/01/2006 – 9/30/2011, \$5,040,000.
3. Improving the estimation of carbon stocks and fluxes in semi-arid ecosystems of the southwestern US using full-waveform lidar measurements. M. Litvak (PI), A. Neuwenschwander- PI, A. Fox, J. Heilman. NASA – ROSES, Carbon cycle processes, 5/1/2011-4/30/15. \$1,338,361.

4. Ecosystem reconstruction under climate change conditions following fire. S. Collins (PI), M Litvak, W. Pockman, B. Wolf, R. Sinsabaugh. NSF-RAPID, 8/25/2010, \$150,055.
5. Quantifying the role of summer vs. winter precipitation on carbon uptake of montane forests in the Valles Caldera. M. Litvak (PI). NSF Critical Zone Observatory Subcontract through University of Arizona, 6/10-5/11, \$35,000.
6. Linking ecosystem scale vegetation change to shifts in carbon and water cycling: the consequences of piñon mortality in the Southwest. M. Litvak (PI), Bob Sinsabaugh, Nate McDowell, Thom Rahn and Mike Ryan, DOE-EPSCoR University-Lab, 6/1/08-5/31/12, \$495,000.
7. Do vegetation-microclimate feedbacks promote shrub encroachment in the Southwestern United States? Marcy Litvak (PI), Scott Collins and William Pockman, NSF-Ecosystems, 3/1/08-2/31/11, \$289,008.
8. Woody Plant Encroachment into Karst Terrain: Implications for Regional Cycles of Carbon, Water and Energy. Marcy Litvak (PI), James Heilman, Kevin McInnes and Keith Owens, DOE -National Institute for Climate Change Research. 8/2007-7/2010, \$395,000.
9. Carbon and water fluxes in burned and unburned pinon-juniper woodland M. Litvak, W. Pockman, S. Collins, R. Pendleton, B. Pendleton US Forest Service 7/06-9/10, \$87,000.
10. Quantifying the role of summer vs. winter precipitation on carbon uptake of montane forests. M. Litvak SAHRA – Sustainability of semi-Arid Hydrology and Riparian Areas 6/06-12/09, \$170,000.
11. Juniper encroachment on the Edwards Plateau - Changes in carbon dynamics in a key savanna ecosystem of the US. Marcy Litvak, PI NASA Global Change Fellowship to Ann Thijs 9/05-8/08, \$54,000.
12. Quantifying changes in ecosystem structure and function associated with woody plant expansion on the Edwards Plateau. M. Litvak, PI. National Institute of Global Environmental Change 9/04-8/05, \$35,000.
13. Texas Water Development Board, TWDB Enhanced Playa Recharge Monitoring System. B. Scanlon PI, M. Litvak, V. Kelley, Co-PI's. 9/04- 7/05, \$70,000.
14. Net Ecosystem Production Along a Boreal Forest Chronosequence, National Science Foundation, S.T. Gower, M. Goulden, M. Litvak, S. Trumbore, J. Harden. 6/00– 5/05, \$1,000,000.
15. Department of Energy, M. Goulden, PI, M. Litvak, S. Trumbore, co-PI's. 7/0-06/05, \$600,000
16. NSF REU for Environmental Science Institute, University of Texas, J. Brodbelt PI, M. Litvak and others Co-I. 6/02-6/05.

Pending Funding

1. LTER: SEV site - Climate Variability at Dryland Ecotones, NSF, J. Rudgers PI, 2/17-1/22. \$5,400,000.